

Physics Laboratory Safety Handout

Revised: January 2007

Purpose: The purpose of this document is to inform the physics student of the basics of laboratory safety and point out the most common types of safety hazards in the physics laboratory. This document is NOT a complete listing of the safety hazards in this laboratory or any laboratory but rather it plays the role of alerting the student to the possible safety hazards in the laboratory.

Instructors Responsibilities: The laboratory instructor will inform the students of possible hazards in working in the laboratory environment as these hazards present themselves. Some weeks there will be very little to be concerned about and then other weeks there may be multiple safety hazards. The instructor will also maintain a watch on the different laboratory groups and point out safety issues and corrective action as the need arises. If you have a question about safety you are to direct it immediately to the lab instructor.

Student Responsibilities: The students in the physics lab are expected to exercise common sense judgment when working with the laboratory equipment. When personal experience does not help in the identifying and avoiding possible safety hazards the student should exercise extra caution and ask the instructor for assistance. Safety is more important than pride and questions about safety will be answered promptly by the instructor. Note that it is better to NOT proceed if you suspect a safety issue than to learn the hard way a new safety lesson.

Students are expected to listen to and follow all instructions given by the laboratory instructor. This includes all safety precautions and guidelines. Please refrain from “horse play” in the laboratory.

Primary Physics Laboratory Safety Concerns: Although the physics laboratory doesn't usually use chemicals like biology and chemistry labs, there are still safety concerns that not everyone is commonly aware about. Often safety is learned by doing but we wish to avoid this route as much as possible. In the physics lab, the main concerns are mechanical, extreme heat and cold, electrical.

Many of the devices in the physics lab require mechanical motion and use significant amounts of mass. Students should be careful to place themselves and sensitive electronics out of the path of possible lab masses in case a string or other holding device was to fail. This does happen from time-to-time in introductory laboratories.

In a few labs the use of boiling water and steam to test theories of thermodynamics is employed. This represents a scalding hazard and care must be taken when working with hot metals and steam generators. Use gloves and hot pads when handling hot objects and steam lines/generators and always test the temperature of an object before picking it up when you are working with a thermodynamics lab.

Several electrical devices are utilized in the physics lab and in the second semester electrical circuits are built and tested by the students. Most devices are designed to be safe under normal

conditions but when the students build their own circuits often bare wires are available. Please use caution when dealing with bare wires. Most circuits we use are designed by the faculty to operate at non-lethal voltages and currents but this does not excuse carelessness. Turn power supplies off when you are changing significant parts of a circuit.

General Laboratory Rules: The following list of rules is general in nature and applies to the laboratory environment at all times. Rules and guidelines specific to a particular piece of laboratory equipment or a particular laboratory will be given at the time of the laboratory.

- 1) No food or drink is to be consumed in the laboratory. Any food or drink brought to the lab must remain in the students carrying bag until they leave.
- 2) Students must wear appropriate clothing to laboratory. This includes shoes that are not open toed (No sandals, slippers, etc.). Please wear clothing to lab that you don't care if it gets dirty. We don't have a lot of chemicals but you will have to kneel on the floor to make measurements and some of the equipment can have greasy rotation points.
- 3) Place all sensitive electronic equipment safely on your table or within your bag under your table so that expensive damage can be avoided.
- 4) Do not modify or damage the laboratory equipment in any way unless the modification is directed by the instructor. This does not include the changing of a lab setup as prescribed by the procedures in the carrying out of measurements.
- 5) Use care when loosening and tighten screws and bolts. Some of them are plastic and break easily. Treat the equipment as if it were your own.
- 6) Do not force any of the equipment. If an excessive amount of force is necessary then tell your instructor. There is most likely a problem with the setup and we don't want to make the problem worse.
- 7) In case the fire alarm sounds, please exit the building by the nearest safe exit. If the fire is in the room leave everything behind. Your safety is not worth even a \$1000 computer. If the fire is not in the room and immediate danger is not apparent, then quickly and quietly pack your bag and exit the room or just leave the stuff behind. The instructor will lock the doors on the way out to ensure security.
- 8) In the case of any other emergency, follow the instructions of the laboratory instructor and all safety personal that may have responded to the scene.

Remember, safety is the first priority. Let us work toward a safe and productive semester in physics lab.